UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

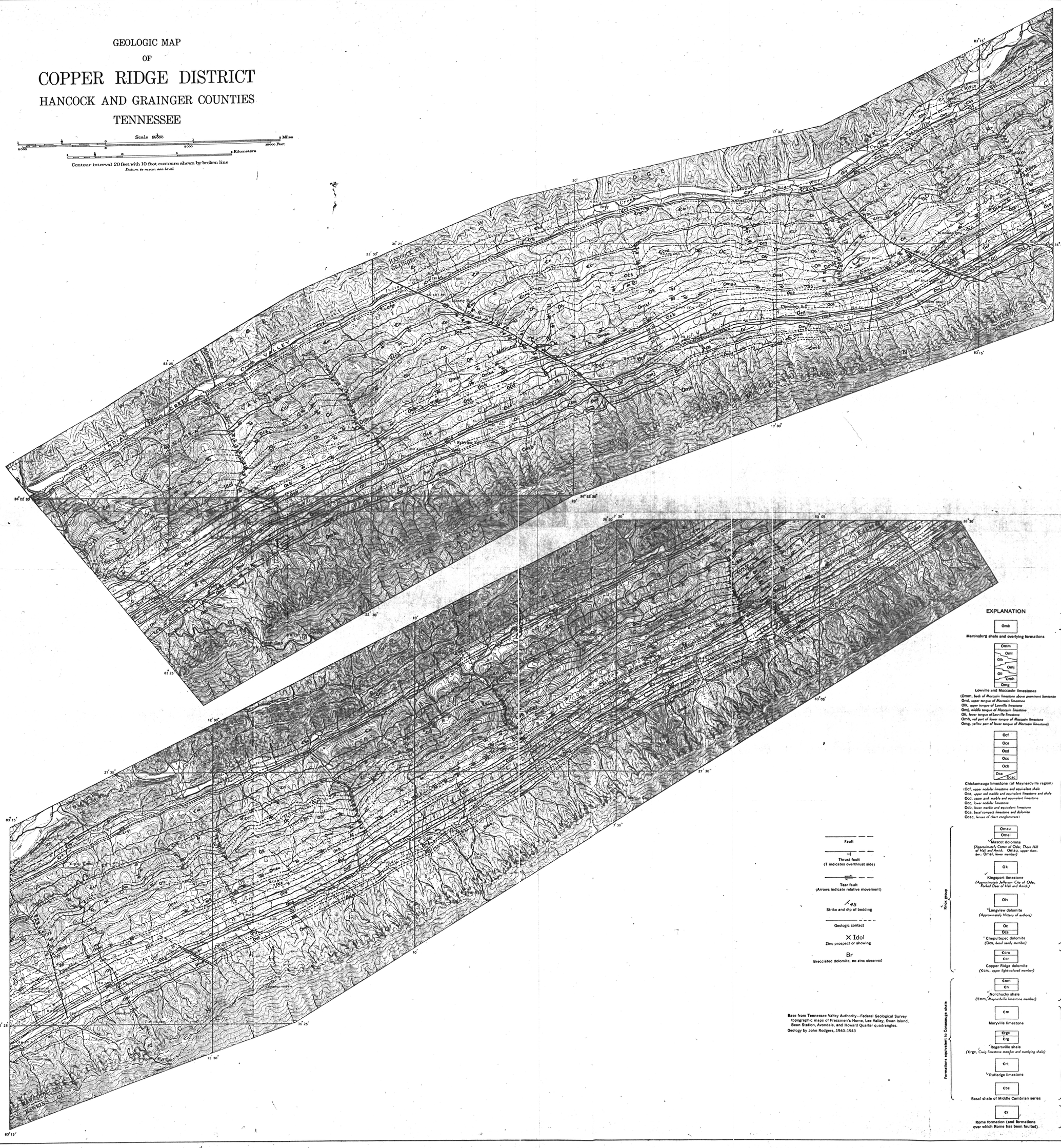
STRATEGIC MINERALS INVESTIGATIONS
PRELIMINARY MAP

GEOLOGIC MAP
OF
COPPER RIDGE DISTRICT
HANCOCK AND GRAINGER COUNTIES
TENNESSEE

Scale 1:6000

1 0 1 2 3 Miles
6000 0 6000 10000 Feet
1 0 1 2 3 Kilometers

Contour interval 20 feet, with 10 foot contours shown by broken line
Datum is mean sea level



Base from Tennessee Valley Authority--Federal Geological Survey topographic maps of Pressmen's Home, Lee Valley, Swan Island, Bean Station, Avondale, and Howard Quarter quadrangles.
Geology by John Rodgers, 1940-1943

EXPLANATION

Omb — Martinsburg shale and overlying formations — UPPER ORDOVICIAN

Omm, Oml, Olk, Omj, Oll, Omh, Omg — Lowville and Moccasin limestones
(Omm, *beds of Moccasin limestone above prominent bentonite*
Oml, *upper tongue of Moccasin limestone*
Olk, *upper tongue of Lowville limestone*
Omj, *middle tongue of Moccasin limestone*
Oll, *lower tongue of Lowville limestone*
Omh, *red part of lower tongue of Moccasin limestone*
Omg, *yellow part of lower tongue of Moccasin limestone*) — MIDDLE ORDOVICIAN

Ocf, Oce, Ocd, Occ, Ocb, Oca, Ocac — Chickamauga limestone (of Maynardville region)
(Ocf, *upper nodular limestone and equivalent shale*
Oce, *upper red marble and equivalent limestone and shale*
Ocd, *upper pink marble and equivalent limestone*
Occ, *lower nodular limestone*
Ocb, *lower marble and equivalent limestone*
Oca, *basal compact limestone and dolomite*
Ocac, *lenses of chert conglomerate*)

Omau, Omal — Mascot dolomite
(*Approximately Cotter of Oder, Thorn Hill of Hall and Amick.* Omau, *upper member;* Omal, *lower member*)

Ok — Kingsport limestone
(*Approximately Jefferson City of Oder, Forked Deer of Hall and Amick*)

Olv — Longview dolomite
(*Approximately Nittany of authors*)

Oc, Ocs — Chepultepec dolomite
(Ocs, *basal sandy member*)

Knox group — LOWER ORDOVICIAN

Ccru, Ccr — Copper Ridge dolomite
(Ccru, *upper light-colored member*) — UPPER CAMBRIAN

Cnm, Cn — Nolichucky shale
(Cnm, *Maynardville limestone member*)

Cm — Maryville limestone

Crgc, Crg — Rogersville shale
(Crgc, *Craig limestone member and overlying shale*)

Crt — Rutledge limestone

Cbs — Basal shale of Middle Cambrian series

Formations equivalent to Conasauga shale — MIDDLE CAMBRIAN

Cr — Rome formation (and formations over which Rome has been faulted) — LOWER CAMBRIAN

Fault

Thrust fault
(T indicates overthrust side)

Tear fault
(Arrows indicate relative movement)

45
Strike and dip of bedding

Geologic contact

× Idol
Zinc prospect or showing

Br
Brecciated dolomite, no zinc observed

COPPER RIDGE ZINC DISTRICT (EAST PART)
HAWKINS, HANCOCK, AND GRAINGER COUNTIES, TENNESSEE

By John Rodgers

The Copper Ridge zinc district extends for 35 miles along Copper Ridge, a strike ridge underlain by dolomite of the Knox group. The Knox group in this region has been divided into five formations, named, in descending order, Mascot dolomite (approximately the Cotter or Thorn Hill of previous reports), Kingsport limestone (approximately Jefferson City or Forked Deer of previous reports), Longview dolomite (approximately the Nittany of previous reports), Chepultepec dolomite, and Copper Ridge dolomite. Mascot and Kingsport are new names used by John Rodgers and D. F. Kent in a paper on the section at Lee Valley, Hawkins County, Tenn., which is in preparation.

Sphalerite has been seen in the Copper Ridge district in beds ranging from the middle of the Longview dolomite to the lower part of the Mascot dolomite, but commercially important showings are practically confined to the Kingsport limestone (here largely dolomite), which contains zinc ore in the Mascot-Jefferson City district to the southwest. Where the Kingsport limestone is crossed by minor tear faults and changes of strike, it commonly is brecciated, and this brecciation has favored the deposition of sulfides. The eastern part of the outcrop belt of the Knox group and adjacent formations has therefore been mapped geologically, with a view to determining the location of these favorable structural features. The mapping was carried from the northeasternmost known occurrence of zinc on Copper Ridge, which is at the E. J. Lee prospect near Sweet Creek, 2 miles northeast of Shiloh, to Thorn Hill, about 21 miles to the southwest. The results are shown on the map herewith.

Within the part of the belt that has been mapped, three areas were selected for further especially detailed study and were mapped on a larger scale than the belt as a whole. They are, from northeast to southwest, the Shiloh area, centering at Shiloh Gulch, a part of the Treadway area, extending from the ravine of Flat Gap Creek to that of Little War Creek, and the Idol area, around the ravine of Joe Mill Creek. Zinc showings at other localities are noted on the general map.

The Shiloh area is situated at a slight anticlinal change in strike, the general strike northeast of Shiloh being N. 61° E. and that southwest of Shiloh N. 64° E. The Shiloh (Ledford) prospect is located at this change in strike, and the structure adjacent to this prospect is shown on the map of the Shiloh area, Hawkins County, Tenn., which is issued separately.

The Treadway area embraces a more marked anticlinal change in strike, from N. 60° E., north of Treadway, to N. 85° W., west of Little War Creek. Here, moreover, the Chickamauga limestone is cut by several tear faults, and two of these faults continue north and cut the Knox formations. One of them crosses the Kingsport limestone close to the Johns prospect. The structure at that prospect is shown on the map of the Johns prospect, Hancock County, Tenn., which is issued separately. The other fault cutting the Knox group is the largest tear fault in the Copper Ridge district, having a stratigraphic displacement of at least 300 feet at the top of the group, but as there are no outcrops where this fault crosses the Kingsport limestone it is not known whether that formation is brecciated or mineralized near the fault. At the Davis prospect on Little War Creek, west of this fault, sphalerite occurs in several beds in the Kingsport limestone, but no large thickness of ore-bearing rock is exposed.

Complementary to the anticlinal shift in strike near Treadway is a synclinal shift near Indian Creek, farther southwest. At that locality there is another tear fault, which displaces the top of the Knox group at least 800 feet. In many places near this fault the rock is severely brecciated, but very little sphalerite is visible.

In the Idol area at Joe Mill Creek there is a slight synclinal change in strike, the general strike being N. 65° E. northeast of the creek and N. 50° E. southwest of the creek. The Idol (Comstock) prospect is located at this change in strike, and the structure near it is shown on the map of the Idol prospect, Grainger County, Tenn., which is issued separately. The beds of the Kingsport limestone, which are mineralized at the Idol prospect, are also mineralized at the Dalton prospect, 12 miles northeast, but no structural irregularities were observed there.